

03.05.2001

## Claims

(100)

- Sub B1
1. A process for producing nitrosonium ions by oxidising a nitroxyl compound with an oxidising agent, *characterised* in that the nitroxyl compound is oxidised in the presence of a complex of a transition metal and a complexing agent.
2. A process according to Claim 1, wherein the nitroxyl compound is a di-tert-nitroxyl compound, especially 2,2,6,6-tetramethylpiperidin-1-oxyl (TEMPO).
- Sub A1
3. A process according to Claim 1 or 2, wherein the transition metal is manganese, iron, cobalt, nickel, copper or vanadium.
4. A process according to any one of Claims 1-3, wherein the complexing agent is a nitrogen-containing compound.
5. A process according to Claim 4, wherein the complexing agent is a bipyridyl or a triazonane or a (poly)histidine.
- Sub A2
6. A process for oxidising a carbohydrate with an oxidising agent in the presence of a nitrosonium ion as a catalyst, *characterised* in that the nitrosonium ion is produced by the process according to any one of Claims 1-5.
7. A process according to Claim 6, wherein the carbohydrate is an  $\alpha$ -glucan or fructan or a derivative thereof.
- Sub A3
8. A process according to any one of Claims 1-7, wherein a carbonyl-containing carbohydrate containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule is produced.
9. A process according to any one of Claims 1-8, wherein the carbohydrate is a hydroxyalkylated carbohydrate or a glycoside.
10. An oxidised carbohydrate, the carbohydrate being selected from disaccharides, oligosaccharides and polysaccharides of the  $\alpha$ -glucan, mannan, galactan, fructan, and chitin types and carbohydrate glycosides, containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule or a chemical derivative thereof, and further containing carboxyl and/or carboxymethyl groups.

- sub B1
- sub A4
11. An oxidised carbohydrate according to Claim 10, containing at least 5 monosaccharide units per average molecule.
12. A carbohydrate derivative selected from disaccharides, oligosaccharides and polysaccharides of the  $\alpha$ -glucan, mannan, galactan, fructan, and chitin types and carbohydrate glycosides, containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule, in which derivative at least a part of the carbaldehyde groups has been converted to a group with the formula  $-\text{CH}=\text{N}-\text{R}$  or  $-\text{CH}_2\text{NHR}$ , wherein R is hydrogen, hydroxyl, amino, or a group  $\text{R}^1$ ,  $\text{OR}^1$  or  $\text{NHR}^1$ , in which  $\text{R}^1$  is  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_1\text{-C}_{20}$  acyl, a carbohydrate residue, or group coupled with or capable of coupling with a carbohydrate residue.
13. A carbohydrate derivative selected from disaccharides, oligosaccharides and polysaccharides of the  $\alpha$ -glucan, mannan, galactan, fructan, and chitin types and carbohydrate glycosides, containing at least 1 cyclic monosaccharide chain group carrying a carbaldehyde group per 25 monosaccharide units and per average molecule, in which derivative at least a part of the carbaldehyde groups has been converted to a group with the formula  $-\text{CH}(\text{OR}^3)-\text{O}-\text{CH}_2-\text{COOR}^2$  or  $-\text{CH}(-\text{O}-\text{CH}_2-\text{COOR}^2)_2$ , in which  $\text{R}^2$  is hydrogen, a metal cation or an optionally substituted ammonium group, and  $\text{R}^3$  is hydrogen or a direct bond to the oxygen atom of a dehydrogenated hydroxyl group of the carbohydrate.
14. A carbohydrate according to Claim 12 or 13, further containing carboxyl and/or carboxymethyl groups.
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